

Appl. No.: 10/014,337
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Reply to Office Action of May 20, 2005

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I. AMENDMENTS TO THE CLAIMS:

The following listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of characterizing a computer system having resources and processes, the processes consuming the resources when performing transactions, the method comprising:

independently generating a log of transactions performed in ~~[[a]]~~ the computer system, wherein the log of transactions comprises a timestamp for each of the transactions;

independently generating a log of resource usage in the computer system, wherein the log of resource usage comprises one or more periods of time during which each of a plurality of the resources is used, and wherein the log of resource usage comprises a plurality of system performance metrics, ~~which reflect resource the system~~ performance metrics reflecting consumption of the resources by one or more of the processes that performed the transactions;

comparing the timestamps in the log of transactions to the periods of time in the log of resource usage to determine timestamps corresponding to the periods of time; and determining which transactions used which resources based on ~~said comparing the~~ comparison of the timestamps in the log of transactions to the periods of time in the log of resource usage.

2. (Currently Amended) The method of claim 1, wherein said determining which transactions used which resources based on ~~said comparing the comparison of~~ the timestamps in the log of transactions to the periods of time in the log of resource usage comprises:

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- computing at least one correlation coefficient by computing a covariance of transaction activities and resource usage in the logs; and
analyzing whether the at least one correlation coefficient is at least greater than a desired correlation value to determine whether the transactions use the resource.
3. (Original) The method of claim 1, wherein said determining which transactions used which resources includes determining the amount of resources used by each of one or more of the transactions.
4. (Original) The method of claim 1, further comprising:
determining one or more workloads based on said determining which transactions used which resources, wherein each workload comprises a partition of the transactions performed on the computer system.
5. (Currently Amended) The method of claim 4, further comprising:
modeling performance of the computer system using the workloads by correlating the transactions of the workloads to the resource usage utilized by the transactions of the workloads.
6. (Currently Amended) The method of claim 5, further comprising:
altering a configuration of the computer system ~~as a result of~~ based on the modeling the performance of the computer system.
7. (Original) The method of claim 1, further comprising:
determining an aggregate workload, wherein the aggregate workload comprises a plurality of the workloads.

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8. (Original) The method of claim 1, further comprising:
determining one or more workloads based on said determining which transactions used
which resources, wherein each workload comprises a meaningful partition of the
processes.
9. (Original) The method of claim 8, further comprising:
determining a quantity of resource usage belonging to each workload.
10. (Original) The method of claim 8, further comprising:
determining that processes having a same owner belong to a same one of the workloads.
11. (Original) The method of claim 8, further comprising:
determining that processes whose owners are members of a same group belong to a same
one of the workloads.
12. (Original) The method of claim 8, further comprising:
determining that processes having a same process tree belong to a same one of the
workloads.
13. (Currently Amended) The method of claim 1, wherein said determining which
transactions used which resources is performed automatically by the computer system.

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14. (Currently Amended) A method of characterizing workload of a computer system having resources and processes, the processes consuming the resources when performing transactions, the method comprising:

independently determining a list of transactions performed on [[a]] the computer system over a time interval;

independently determining a list of system performance metrics for the computer system over the time interval, wherein the system performance metrics reflect ~~resource~~ consumption of the resources by one or more of the processes that performed the transactions;

determining a correlation coefficient for each of one or more pairs of system performance metric and transactions in the lists;

determining a supporting set of pairs of system performance metrics and transactions whose correlation coefficients exceed a desired correlation value; and

determining a workload using the supporting set, wherein the workload comprises a meaningful partition of transactions performed on the computer system.

15. (Original) The method of claim 14, wherein said determining the workload comprises determining the workload such that the workload comprises processes which correlate to the system performance metrics in the supporting set.

16. (Original) The method of claim 14, wherein said determining the workload comprises determining the workload such that the workload comprises processes whose resource consumption as reflected by the system performance metrics correlates with the partition of transactions in the workload.

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17. (Currently Amended) A ~~carrier-medium~~ programmable storage device comprising program instructions, wherein the program instructions are computer-executable to implement a method of characterizing a computer system having resources and processes, the processes consuming the resources when performing transactions, the method comprising:

independently generating a log of transactions performed in [[a]] the computer system,
wherein the log of transactions comprises a timestamp for each of the
transactions;

independently generating a log of resource usage in the computer system, wherein the log
of resource usage comprises one or more periods of time during which each of a
plurality of the resources is used, and wherein the log of resource usage comprises
a plurality of system performance metrics, ~~which reflect resource the system~~
performance metrics reflecting consumption of the resources by one or more
processes that performed the transactions;

comparing the timestamps in the log of transactions to the periods of time in the log of
resource usage; and

determining which transactions used which resources ~~as a result of the comparing based~~
on the comparison of the timestamps in the log of transactions to the periods of
time in the log of resource usage.

18. (Currently Amended) The ~~carrier-medium~~ programmable storage device of claim 17,
wherein said determining which transactions used which resources based on ~~said comparing the~~
comparison of the timestamps in the log of transactions to the periods of time in the log of
resource usage comprises:

computing at least one correlation coefficient by computing a covariance of transaction
activities and resource usage in the logs; and

analyzing whether the at least one correlation coefficient is at least greater than a desired
correlation value to determine whether the transactions use the resource.

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19. (Currently Amended) The ~~carrier-medium~~ programmable storage device of claim 17, wherein said determining which transactions used which resources includes determining the amount of resources used by each of one or more of the transactions.

20. (Currently Amended) The ~~carrier-medium~~ programmable storage device of claim 19, wherein the program instructions are further computer-executable to implement:

determining one or more workloads based on said determining which transactions used which resources, wherein each workload comprises a partition of the transactions performed on the computer system.

21. (Currently Amended) The ~~carrier-medium~~ programmable storage device of claim 20, wherein the program instructions are further computer-executable to implement:

modeling performance of the computer system using the workloads by correlating the transactions of the workloads to the resource usage utilized by the transactions of the workloads.

22. (Currently Amended) The ~~carrier-medium~~ programmable storage device of claim 21, wherein the program instructions are further computer-executable to implement:

altering a configuration of the computer system ~~as a result of~~ based on the modeling the performance of the computer system.

23. (Currently Amended) The ~~carrier-medium~~ programmable storage device of claim 19, wherein the program instructions are further computer-executable to implement:

determining an aggregate workload, wherein the aggregate workload comprises a plurality of the workloads.

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24. (Currently Amended) The ~~earlier-medium~~ programmable storage device of claim 19, wherein the program instructions are further computer-executable to implement:
- determining one or more workloads based on said determining which transactions used which resources, wherein each workload comprises a meaningful partition of the processes.
25. (Currently Amended) The ~~earlier-medium~~ programmable storage device of claim 24, wherein the program instructions are further computer-executable to implement:
- determining a quantity of resource usage belonging to each workload.
26. (Currently Amended) The ~~earlier-medium~~ programmable storage device of claim 24, wherein the program instructions are further computer-executable to implement:
- determining that processes having a same owner belong to a same one of the workloads.
27. (Currently Amended) The ~~earlier-medium~~ programmable storage device of claim 24, wherein the program instructions are further computer-executable to implement:
- determining that processes whose owners are members of a same group belong to a same one of the workloads.
28. (Currently Amended) The ~~earlier-medium~~ programmable storage device of claim 24, wherein the program instructions are further computer-executable to implement:
- determining that processes having a same process tree belong to a same one of the workloads.
29. (Currently Amended) The ~~earlier-medium~~ programmable storage device of claim 19, wherein said determining which transactions used which resources is performed automatically by the computer system.

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30. (Currently Amended) A ~~carrier-medium~~ programmable storage device comprising program instructions, wherein the program instructions are computer-executable to implement a method of characterizing workload of a computer system having resources and processes, the processes consuming the resources when performing transactions, the method comprising:

independently determining a list of transactions performed on a computer system over a time interval;

independently determining a list of system performance metrics for the computer system over the time interval, wherein the system performance metrics reflect resource consumption of the resources by one or more of the processes that performed the transactions;

determining a correlation coefficient for each of one or more pairs of system performance metrics and transactions in the lists;

determining a supporting set of pairs of system performance metrics and transactions whose correlation coefficients exceed a desired correlation value; and

determining a workload using the supporting set, wherein the workload comprises a meaningful partition of transactions performed on the computer system.

31. (Currently Amended) The ~~carrier-medium~~ programmable storage device of claim 30, wherein said determining the workload comprises determining the workload such that the workload comprises processes which correlate to the system performance metrics in the supporting set.

32. (Currently Amended) The ~~carrier-medium~~ programmable storage device of claim 30, wherein said determining the workload comprises determining the workload such that the workload comprises processes whose resource consumption as reflected by the system performance metrics correlates with the partition of transactions in the workload.

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33. (Currently Amended) A system for characterizing a computer system having resources and processes, the processes consuming the resources when performing transactions, the system comprising:

a CPU;

a memory coupled to the CPU, wherein the memory stores program instructions which are executable by the CPU to:

independently generate a log of transactions performed in [[a]] the computer system, wherein the log of transactions comprises a timestamp for each of the transactions;

independently generate a log of resource usage of the resources in the computer system, wherein the log of resource usage comprises one or more periods of time during which each of a plurality of the resources is used, and wherein the log of resource usage comprises a plurality of system performance metrics, which reflect the system performance metrics reflecting resource consumption of the resources by one or more of the processes that performed the transactions;

compare the timestamps in the log of transactions to the periods of time in the log of resource usage; and

determine which transactions used which resources as a result of the comparing based on the comparison of the timestamps in the log of transactions to the periods of time in the log of resource usage.

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34. (Currently Amended) The system of claim 33, wherein said determining which transactions used which resources based on ~~said comparing~~ the comparison of the timestamps in the log of transactions to the periods of time in the log of resource usage comprises:

computing at least one correlation coefficient by computing a covariance of transaction activities and resource usage in the logs; and
analyzing whether the at least one correlation coefficient is at least greater than a desired correlation value to determine whether the transactions use the resource.

35. (Original) The system of claim 33, wherein said determining which transactions used which resources includes determining the amount of resources used by each of one or more of the transactions.

36. (Original) The system of claim 33, wherein the program instructions are further executable by the CPU to:

determine one or more workloads based on said determining which transactions used which resources, wherein each workload comprises a partition of the transactions performed on the computer system.

37. (Currently Amended) The system of claim 36, wherein the program instructions are further executable by the CPU to:

model performance of the computer system using the workloads by correlating the transactions of the workloads to the resource usage utilized by the transactions of the workloads.

38. (Currently Amended) The system of claim 37, wherein the program instructions are further executable by the CPU to:

alter a configuration of the computer system ~~as a result of~~ based on modeling the performance of the computer system.

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39. (Original) The system of claim 33, wherein the program instructions are further executable by the CPU to:

determine an aggregate workload, wherein the aggregate workload comprises a plurality of the workloads.

40. (Currently Amended) The system of claim 33, wherein the program instructions are further executable by the CPU to:

determine one or more workloads ~~as a result of~~ based on determining which transactions used which resources, wherein each workload comprises a meaningful partition of the processes.

41. (Original) The system of claim 40, wherein the program instructions are further executable by the CPU to:

determine a quantity of resource usage belonging to each workload.

42. (Original) The system of claim 40, wherein the program instructions are further executable by the CPU to:

determine that processes having a same owner belong to a same one of the workloads.

43. (Original) The system of claim 40, wherein the program instructions are further executable by the CPU to:

determine that processes whose owners are members of a same group belong to a same one of the workloads.

44. (Original) The system of claim 40, wherein the program instructions are further executable by the CPU to:

determine that processes having a same process tree belong to a same one of the workloads.

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45. (Currently Amended) The system of claim 33, wherein said determining which transactions used which resources is performed automatically by the computer system.

46. (Currently Amended) A system for characterizing a computer system having resources and processes, the processes consuming the resources when performing transactions, the system comprising:

a CPU;

a memory coupled to the CPU, wherein the memory stores program instructions which are executable by the CPU to:

independently determine a list of transactions performed on a computer system over a time interval;

independently determine a list of system performance metrics for the computer system over the time interval, wherein the system performance metrics reflect ~~resource~~ consumption of the resources by one or more of the processes that performed the transactions;

determine a correlation coefficient for each of one or more pairs of system performance metrics and transactions;

determine a supporting set of pairs of system performance metrics and transactions whose correlation coefficients exceed a desired correlation value; and

determine a workload using the supporting set, wherein the workload comprises a meaningful partition of transactions performed on the computer system.

47. (Original) The system of claim 46, wherein in determining the workload, the program instructions are executable by the CPU to determine the workload such that the workload comprises processes which correlate to the system performance metrics in the supporting set.

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48. (Original) The system of claim 46, wherein in determining the workload, the program instructions are executable by the CPU to determine the workload such that the workload comprises processes whose resource consumption as reflected by the system performance metrics correlates with the partition of transactions in the workload.